DOCUMENT RESUME

ED 412 647 EA 028 725

AUTHOR Dorman, Jeffrey P.

TITLE Classroom Environment in Australian Catholic Schools: A Study Utilising Quantitative and Qualitative Methods.

PUB DATE 1997-03-00

NOTE 26p.; Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, IL, March 24-28, 1997).

PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.

DESCRIPTORS *Catholic Schools; Coeducation; Data Collection; *Educational Environment; Foreign Countries; *High School Students; High Schools; Qualitative Research; *Religious Education; Research Methodology; *Secondary School Teachers; Single Sex Schools; Student Attitudes

IDENTIFIERS *Australia

ABSTRACT

This paper reports learning environment research conducted in Australian Catholic high schools. A two-stage methodology involving quantitative and qualitative data-collection methods was employed. In the first stage, a sample of 1,719 students and 160 teachers responded to a specially developed classroom-environment questionnaire. Results indicated that Catholic girls' schools had more positive classroom environments than Catholic coeducational and boys' schools. The environments of religion and science classes were remarkably similar. Stage 2 of the study used interview techniques in 2 schools to establish 3 assertions; interviews of 2 administrators, 3 teachers, 2 parents, and 12 students from each of 2 schools were conducted. Three findings stand out: First, commitment to a set of values is important to generating positive learning environments. Second, formal pastoral care does not guarantee positive learning environments. Third, religion teachers utilize strategies found successful in other curriculum areas. The methodology of the study demonstrated the usefulness of employing quantitative and qualitative methods in one learning environment study. (Contains 1 figure, 6 tables, and 42 references.) (Author/SLD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 412 647

CLASSROOM ENVIRONMENT IN AUSTRALIAN CATHOLIC SCHOOLS: A STUDY UTILISING QUANTITATIVE AND QUALITATIVE METHODS

Jeffrey P. Dorman
School of Education
Australian Catholic University
P.O. Box 247, Everton Park 4053
Queensland Australia

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

J. Dorman

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Paper presented at the annual meeting of the American Educational Research Association (AERA), Chicago, March 1997.

EA 028 225

BEST COPY AVAILABLE

Abstract

This paper reports learning environment research conducted in Australian Catholic high schools. A two stage methodology involving quantitative and qualitative data collection methods was employed. In the first stage, a sample of 1719 students and 160 teachers responded to a specially developed classroom environment questionnaire. Results indicated that Catholic girls' schools had more positive classroom environments than Catholic coeducational and boys' schools. The environments of religion and science classes were remarkable similar. Stage 2 of the study used interview techniques in two schools to establish three assertions. First, commitment to a set of values is important to generating positive learning environments. Second, formal pastoral care does not guarantee positive learning environments. Third, religion teachers utilise strategies found successful in other curriculum areas. The methodology of the study demonstrated the usefulness of employing quantitative and qualitative data collection methods in the one learning environment study.

Over the past three decades, the field of learning environment has shown considerable growth with research studies investigating a range of settings. The vast majority of these studies have employed questionnaires with several underlying scales that have been field tested and found to be reliable assessments of the learning environment. However, in recent years trends towards the use of qualitative research designs or a mix of quantitative and qualitative data collection methods in the one study have become clear.

Although the present study has a strong preliminary stage involving the collection of quantitative data, an attempt has been made to offer explanations for particular findings through the use of qualitative data collection methods. The study represents a departure from previous attempts to utilise quantitative and qualitative data collection methods in the one study of learning environments in that qualitative data were collected after the findings of the quantitative component of the study were known. Specifically, the qualitative component was conceived to be a small but nevertheless important exploratory probe which allowed for questions requiring explanation rather than measurement to be part of the study.

This move towards the mixing of data collection methods in a complementary manner merely reflects recent trends in the wider educational research domain. For example, Firestone (1993) argued that large-scale projects that use aggregates or averages are useful at the broad policy level because they allow inferences about populations to be drawn. However, 'they are of limited utility for making decisions in specific cases' (Firestone, 1993, p. 19). Clearly, there is a trade-off between efficiency and investigator influence. Although employing quantitative procedures allows the researcher more quickly to identify patterns in large amounts of information, such procedures limit the investigator's capacity to understand the nature, meaning, and impact of the information.

Four research questions guided the present study of classroom environment in Australian Catholic high schools:

- To what extent do the classroom environments of Catholic coeducational, Catholic girls' and Catholic boys' schools differ?
- To what extent do the classroom environments of religion and science classes in Catholic schools differ?
- What explanations can be given for the differences in the classroom environment of Catholic schools?
- Why are the environments of religion and science classes so similar?

It should be noted that the final two questions were developed after the quantitative data for the first two research questions had been analysed.

Background

Classroom Environment

The conceptualisation and assessment of the psychosocial environment of classes has become an important field of research (see various reviews by Chavez, 1984; Fraser, 1994; Genn, 1984). These reviews have shown that classroom environment is an important predictor of student learning. Consistent national and international evidence suggests that student perceptions of the classroom environment account for appreciable amount of variance in learning outcomes beyond that attributable to student characteristics. That is, in addition to their intrinsic value, positive classroom environments are linked with better cognitive and affective outcomes of students. For example, McRobbie and Fraser's (1993) study used a sample of 92 chemistry classes in Brisbane high schools to establish overall relationships between learning outcomes and dimensions of the science laboratory classroom environment assessed by the Science Laboratory Environment Inventory.

Some areas of contemporary classroom environment research include assessing computer-assisted learning environments (Maor & Fraser, in press), using classroom environment assessments to assist school psychologists (Burden & Fraser, 1993), exploring the relationship between teacher personality and interpersonal teacher behaviour (Fisher, Fraser, & Kent, 1995), investigating gendered learning environments in single-sex and mixed-sex classes (Rennie & Parker, 1996) and exploring links between students' cultural factors and students' perceptions of the learning environment (Levy, Wubbels, & Brekelmans, 1996; Waldrip & Fisher, 1996). These studies highlight the growing recognition of the learning environment as a central component of the lived curriculum of schools.

Combining Quantitative and Qualitative Data Collection Methods in Classroom Environment Research

Learning environment research has been dominated by the collection and analysis of quantitative data. However, learning environment literature (e.g. Fraser & Tobin, 1991; Templeton & Jensen, 1993; Tobin & Fraser, in press) suggests that there is value in utilising qualitative and quantitative data collection methods in the one study. Templeton and Jensen investigated school environment perceptions of exemplary teachers by using the School-Level Environment Questionnaire (SLEQ) in conjunction with interviews and observations. Tobin and Fraser's study of exemplary practice utilised an interpretive research methodology (Erickson, 1986). Interviews, observation, examination of curriculum materials and student work were supplemented by quantitative information obtained through the use of a variety of classroom environment instruments.

Of great significance to the present study is the wide support for using quantitative and qualitative data collection methods in the one study (Jick 1985; Madey, 1982; Smith & Fraser 1980). Strong theoretical advocates of the existence of two research paradigms (e.g. Smith & Heshusius, 1986) agree that, at the level of specific procedures, data collection methods can be mixed:

> Can quantitative inquirers supplement their controlled instrumentation with open-ended observation in naturalistic settings? or, Can qualitative inquirers supplement naturalistic observation with the quantification of events? The answer to these types of questions is yes.
>
> (Smith & Heshusius, 1986, p. 8)

Howe (1985) argues that, even at the epistemological level, qualitative and quantitative data collection methods are inextricably interwoven. That is, there is philosophical support for combining quantitative and qualitative data collection methods judiciously.

Quantitative research can facilitate qualitative research by the 'the judicious selection of cases for further study' (Bryman, 1988, p. 136). There are many strategies that facilitate this *purposeful sampling* (McMillan & Schumacher, 1993; Patton, 1990). Clearly, purposeful sampling requires that information about the subjects be obtained prior to choosing the sample for the qualitative component of the study. The use of classroom environment instruments with a large sample provides normative data and allows important statistical inferences to be established. In contrast to this probabilistic sampling which characterises quantitative designs, purposeful sampling of qualitative designs allows for information-rich cases to be studied in-depth (Patton, 1990). Thus, using qualitative methods after quantitative findings have been established allows for interesting cases to be investigated. Atypical cases at the margins of the score distribution might be investigated because they are considered important to the research design. Philosophically, the investigation of such extreme cases can be justified on inclusiveness grounds. This approach contrasts with probabilistic sampling designs in which subjects whose scores are well removed from the mean are considered sources of measurement error.

Design of Study

Based on the research questions and issues discussed in the previous section, a two-stage research program was developed. The links between the two stages of the research program need to be clarified. Stage 1 provided normative data to answer the first two research questions of this study through the use of a specially developed instrument to assess classroom environment in Australian Catholic high schools. Analyses involving student data used the class mean as the unit of analysis. On the basis of these analyses, two schools were identified for further investigation in Stage 2 which focused on the remaining two research questions. Two schools were identified as extreme cases. Further details on the process used to identify these two schools are provided in a later section of this paper. Stage 2 was considered an important exploratory complement to the large-scale data collection of Stage 1.

Stage 1 Assessment of Classroom Environment

Existing classroom environment scales were used in the construction of an instrument that would assess the important dimensions of a typical Catholic school classroom. An

TABLE 1
DESCRIPTION OF STUDENT SAMPLE BY GRADE LEVEL AND SUBJECT

	Sample Size					
	Religious Education		Science		Total	
Grade	Classes	Students	Classes	Students	Classes	Students
Grade 9	20	443	20	447	40	890
Grade 12	20	449	20	380	40	829
Total	40	892	40	827	80	1,719

intuitive-rational approach to instrument development which relies on the researcher's intuitive understandings of the dimensions being assessed was adopted (Fraser, 1986).

Sample. A total of 1,719 students in 80 grade 9 and grade 12 religious education and science classes responded to the classroom environment questionnaire. Table 1 describes the student sample by grade level and subject. The classes were drawn from 20 Catholic high schools located in metropolitan Brisbane and provincial centres of Queensland, Australia. Additionally 8 teachers from each of these schools (i.e. a total of 160 teachers) responded to a teacher form of the questionnaire (see below).

Classroom environment instrument. A seven-scale classroom environment instrument with 66 items was developed. Details on the development process have been described elsewhere (Dorman, 1994, 1995). An analogous *teacher form* of the questionnaire in which the wording of several items was altered slightly to accommodate the teacher as respondent was developed. Table 2 provides descriptive information for this instrument. Using data from 1,719 students in Stage 1 of the study, a principal components factor analysis (with varimax rotation) extracted seven factors which accounted for 41.3% of the variance. All items had loadings of at least 0.4 with their a priori scales. Apart from three items, all items had loadings of less than 0.4 with other scales in the a priori structure. A similar analysis using the class mean as the unit of analysis showed the same seven factors to account for 69.4% of the variance. Item-scale correlations confirmed that all items had been assigned to the appropriate scale and that each item made an appropriate contribution to that scale.

Validation data. Table 3 shows validation data for the classroom environment instrument. Scale reliability estimates (using the alpha coefficient) are provided for each scale using the individual student and the teacher as units of analysis. Because of the methodological weakness of using the individual student as the unit of analysis when intact classes are sampled, the student class mean was used as the unit of analysis for student data in the present study (see below). Accordingly, Table 3 provides reliabilities using the class mean as the unit of analysis. As expected, reliabilities are higher when the class mean is employed as the unit of analysis. Table 3 also reports data about discriminant validity using the mean correlation of a scale with the other six scales as a convenient index. These data indicate that the scales do overlap but not to the extent that would violate the psychometric structure of the instrument. In addition, the data compare favourably with discriminant validity data from recent studies involving several well-established instruments (see Fraser, 1994).

TABLE 2
DESCRIPTIVE INFORMATION FOR THE CLASSROOM ENVIRONMENT INSTRUMENT

Scale Name	Scale Description	Source of Scale	Number of Items
Student Affiliation	Extent to which students know, help and are friendly towards each other.	Learning Environment Inventory (LEI) (Fraser, Anderson & Walberg, 1982) Classroom Environment Scale (CES) (Moos & Trickett, 1987)	9
Interactions	Extent to which teacher-student interactions emphasise a Christian concern for the personal welfare and social growth of the student.	Researcher, with three items from the College & University Classroom Environment Inventory (CUCEI) (Fraser, 1994) Personalisation scale.	10
Cooperation	Extent to which students cooperate rather than compete with each other. Researcher, with some influence of LEI Competitiveness scale.	Researcher, with some influence of LEI competitiveness scale.	10
Task Orientation	Extent to which it is important to complete activities planned and to stay on the subject matter.	CES	9
Order & Organisation	Emphasis on students behaving in an orderly, quiet and polite manner, and on the overall organisation of classroom activities.	CES	10
Individualisation	Extent to which students are allowed to make decisions and are treated differently according to ability, interest and rate of working.	Individualised Classroom Environment Questionnaire (ICEQ) (Fraser, 1990) CUCEI (Fraser, 1994)	9
Teacher Control	The number of rules, how strictly rules are enforced and how severely infractions are punished.	CES	9

TABLE 3
INTERNAL CONSISTENCY (ALPHA RELIABILITY), MEAN CORRELATION WITH OTHER SCALES AND ANOVA RESULTS FOR THE CLASSROOM ENVIRONMENT INSTRUMENT FOR THREE UNITS OF ANALYSIS
(N = 1,719 students, 160 teachers, 80 class means)

	Alpha Reliability			Mean Correlation with Other Scales			ANOVA Results	
Scale	Student	Teacher	Class Mean	Student	Teacher	Class Mean	F (79,1639)	Eta^2
Student Affiliation	.68	.75	.84	.22	.27	.32	4.85**	.19
Interactions	.91	.80	.97	.25	.28	.36	8.08**	.28
Cooperation	.72	.69	.84	.28	.22	.36	4.81**	.19
Task Orientation	.77	.70	.90	.37	.26	.32	7.51**	.27
Order & Organ.	.85	.80	.94	.35	.27	.36	9.83**	.32
Individualisation	.54	.73	.80	.15	.16	.34	6.39**	.23
Teacher Control	.76	.71	.87	.21	.19	.28	6.93**	.25

** $p < .001$

A one-way ANOVA for each classroom environment scale, with the student as the unit of analysis and class membership as the main effect, showed that each scale of the instrument discriminated between classes ($p < .001$). The results of these analyses are shown in Table 3. The eta^2 statistic indicated that the proportion of variance explained by class membership ranged from 19% for the Student Affiliation and Cooperation scales to 32% for the Order and Organisation scale.

Stage 2 Exploratory Probe

This stage involved an in-depth study of two schools through the collection of interview data relating to the final two research questions. Semi-structured interviews with students, teachers, school administrators and parents were conducted. Students were interviewed in groups of three. All other interviews were conducted individually. Follow-up interviews with the 19 participants were used to clarify issues and investigate inconsistent and disconfirming evidence. The selection of these two schools and the focus of the questioning were dependent on the findings of Stage 1 of the study.

Results and Discussion

Stage 1

Research question 1: To what extent do the classroom environments of Catholic coeducational, Catholic girls' and Catholic boys' schools differ? The 80 class means for each of the seven environment scales were analysed using a two-way MANOVA with the set of seven classroom environment scales as the dependent variables and school type (Catholic coeducational, Catholic girls', Catholic boys') and subject (religion, science) as the independent variables. No interaction effects were significant ($p < .05$).

Because the school type effect was significant ($p < .001$), univariate F tests were interpreted. These tests revealed that the three school types differed significantly on four scales: Student Affiliation [$F(2,74) = 4.25$ ($p < .05$)], Interactions [$F(2,74) = 4.67$ ($p < .01$)], Cooperation [$F(2,74) = 14.36$ ($p < .001$)] and Task Orientation [$F(2,74) = 3.15$ ($p < .05$)]. Tukey's post-hoc procedure was employed to establish pairs of school types for which classroom environments differed significantly. It was found that significantly higher levels of Student Affiliation, Interactions and Cooperation existed in Catholic girls' schools compared to both Catholic coeducational schools and Catholic boys' schools. Task Orientation was significantly higher in Catholic girls' schools compared to Catholic boys' schools.

An overall picture of these comparisons is given in Table 4 which shows mean scores and standard deviations according to school type for each classroom environment scale. A noteworthy feature of these results is that mean scores for Catholic boys' schools for the Cooperation, Task Orientation, and Order and Organisation are the lowest of the three school types. Only small differences between the school types is evidenced for the Individualisation and Teacher Control scales.

TABLE 4
MEAN AND STANDARD DEVIATION FOR THREE SCHOOL TYPES
AND TWO SUBJECTS FOR SEVEN CLASSROOM ENVIRONMENT SCALES

Classroom Environment Scale	School Type						Subject			
	Catholic Coed		Catholic Girls'		Catholic Boys'		Religion		Science	
	M	SD	M	SD	M	SD	M	SD	M	SD
Student Affiliation	31.3	2.0	32.9	2.3	31.4	1.9	31.6	2.3	31.8	2.0
Interactions	36.2	4.1	39.4	3.2	36.7	4.3	37.2	3.2	37.0	4.9
Cooperation	32.2	2.2	34.5	2.2	30.9	2.1	32.9	2.5	32.0	2.4
Task Orientation	28.4	3.1	29.9	3.2	27.7	2.7	27.6	2.3	29.7	3.5
Order and Organisation	26.9	4.0	28.4	4.1	26.6	4.1	27.1	3.4	27.4	4.7
Individualisation	24.2	2.3	23.9	1.6	24.1	2.3	24.3	1.8	23.9	2.4
Teacher Control	31.7	2.9	30.6	2.3	30.7	3.0	31.3	2.5	31.0	3.1

In this study, the single-sex schools were order schools. That is, they were administered by a Catholic religious order. Folklore suggests that single-sex schools (being more established and permeated by the order's charism) have a distinctive (and superior) environment compared to Catholic coeducational schools. The evidence from this study supports this view in relation to Catholic girls' schools but not for Catholic boys' schools. Overall, Catholic boys' schools had quite negative environments compared to the other two school types.

The direction of the differences in classroom environment between Catholic girls' schools and Catholic coeducational schools is in general agreement with the findings of Trickett, Trickett, Castro and Schaftner's (1982) study of single-sex and coeducational private schools in the United States. This study, which grouped girls' and boys' schools together, reported significant differences between single-sex and coeducational school classrooms on four of the nine scales of Moos and Trickett's (1987) Classroom Environment Scale (viz. Student Involvement, Affiliation, Task Orientation, and Order and Organisation). For these scales, the single-sex schools scored higher than the coeducational schools.

Catholic school literature has not ventured a position on the single-sex school versus coeducational school issue. In a pragmatic fashion, Catholic education administrators have amalgamated single-sex schools where necessary to form a coeducational school with a better economy of scale. That is, these decisions have been based on financial rather than educational grounds. Clearly, an advantage of the Catholic school system in Queensland is that, especially in the metropolitan areas, parents and students are given a choice of school type.

Research question 2: To what extent do the classroom environments of religion and science classes in Catholic schools differ? In the multivariate test described above, the main effect of subject was significant ($p < .001$). Univariate F tests revealed two scales

for which religion and science classes differed significantly, namely, Cooperation [$F(1,74) = 4.19$ ($p < .05$)] and Task Orientation [$F(1,74) = 11.97$ ($p < .001$)]. Table 4 shows the mean scores for this comparison. Of note are the small differences between the scores of religion and science classes on all of the scales apart from Cooperation and Task Orientation.

It is clear that religion and science classes are perceived by students in very similar ways. This finding is remarkable because religion and science teachers tend to view the subjects as vastly different in content, style and opportunities for flexibility in the classroom. On the basis of the evidence presented here, it could be argued that religion classes are being taught much like science classes. At the very least, students are perceiving the environments of these two subjects in similar ways. The significantly higher Task Orientation of science compared to religion reflects a view that religion classes do not have to be taken as seriously as science, and reinforces the view that the formal curriculum is essentially *assessment-driven*. Accordingly, students are prone to assert that *RE doesn't count*.

It could be that, over the past 15 or so years, both science and religion classes have made dramatic shifts from an objectivist epistemology and that the similarity in environment assessment is a positive outcome. However, there is little evidence to show that science teachers have shifted from the objectivist mode to a more constructivist approach to teaching. The constructivist view is that knowledge resides in individuals; that knowledge cannot be transferred intact from the head of a teacher to the heads of students. The student tries to make sense of what is taught by trying to fit it with his/her experience (Lorsbach & Tobin, 1992, p. 9). Clearly, the constructivist approach to science teaching and the *shared Christian praxis* model advocated by Groome (1980) for religious education have much in common. Christian religious education by shared Christian praxis involves "a group of Christians sharing in dialogue their critical reflection on present action in light of the Christian story and its Vision toward the end of lived Christian faith" (Groome, 1980, p. 184).

Although it is becoming fashionable for some science teachers to adopt the rhetoric of constructivism, few science teachers are genuine constructivists. High school science teachers face increasing accountability pressures and time constraints, and the adoption of information-transmission approaches is understandable but lamentable. By contrast, far more flexibility with time and assessment is afforded to teachers and students in religion classes in Australian Catholic schools. If constructivism requires learners to be given time to think and make sense of what they are learning, then religion classes are well placed to demonstrate a more constructivist learning environment. It would appear that an objectivist epistemology is entrenched in the teaching of religion as well as science. In the present study, the low score on the Individualisation scale for science and religion classes supports this general view. It is probably true that neither constructivism nor shared Christian praxis is being embraced in classrooms to any significant degree.

Selection of Data Collection Sites for Stage 2

The methodology for this study required the selection of two extreme cases (i.e. schools) for closer investigation. Such extreme-case sampling is one of the many purposeful

sampling strategies delineated by Patton (1990). To identify these two schools, quantitative data collected in Stage 2 of the research program were analysed using two procedures: graphing of school means of classroom environment results and cluster analyses involving classroom environment results for each school. This section justifies the choice of the two data collection sites.

Graphing of School Means. Using student data, school means for the seven classroom environment scales for each of the 20 Catholic schools were computed. An inspection of these graphs showed that two schools (viz. School 6 and School 11) had scores on most scales that were well separated. A more parsimonious representation was gained by graphing standardised scores separately for student and teacher perceptions for each of the seven scales for these two schools (see Figure 1). Standardised scores (which were calculated using the mean and the standard deviation of the scores for the 20 Catholic schools) provided a clear indication of the position of Schools 6 and 11 relative to the mean for the 20 Catholic schools involved in this study. Clearly, these results indicate that Schools 6 and 11 are extreme cases.

Cluster Analysis. The second procedure was non-hierarchical cluster analysis which identified homogeneous groups or clusters of schools based on their classroom environment data. The advantage of cluster analysis over the inspection of means was that cluster analysis considered the seven classroom environment scales for each school simultaneously. Thus, an overall picture of each school's classroom-level environment was used to assign schools to clusters. Subsequently, schools were described in terms of the overall characteristics of the cluster to which they were assigned. *Cluster centres*

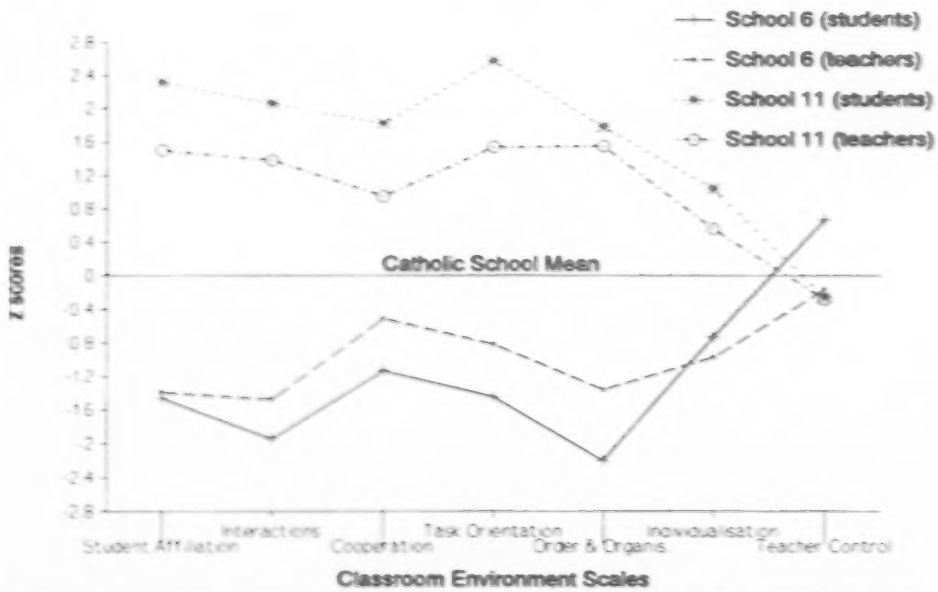

Figure 1 Standardised school means for student and teacher scores in two schools for seven classroom environment scales

BEST COPY AVAILABLE

(which were derived from the mean classroom environment scores for the schools in the cluster) provided an indication of the strength of a scale in any particular cluster. Standardised school means were used in two separate cluster analyses. These analyses used classroom environment data of students and classroom environment data of teachers. The results were interpreted by using a five-way descriptor system (viz. Low, Low-Moderate, Moderate, Moderate-High and High). Six-cluster solutions were accepted for the two analyses. The important information from these analyses for Schools 6 and 11 are shown in Tables 5 and 6. These analyses resulted in Schools 6 and 11 being identified in different clusters. Moreover, Schools 6 and 11 were assigned to groups that could be described as approximate opposites. Taken collectively, these results provided strong evidence that School 6 and 11 were extreme cases. As access to these schools was assured, they were accepted as the two data collection sites for the qualitative component of the study.

TABLE 5
CLUSTER CENTRE WITH DESCRIPTION FOR SCHOOLS 6 AND 11 USING STUDENT CLASS MEANS FOR SEVEN CLASSROOM ENVIRONMENT SCALES

School		Student Affiliation	Interactions	Cooperation	Task Orient.	Order & Organis.	Individual-isation	Teacher Control
School 6	Cluster centre	-.39	-1.81	-.59	-.67	-1.47	-.63	.58
	Description	Low-Mod.	Low	Low-Mod.	Low	Low	Low	Mod.-High
School 11	Cluster centre	1.16	.83	1.53	.28	.92	1.24	-.37
	Description	High	High	High	Mod.	High	High	Low-Mod.

TABLE 6
CLUSTER CENTRE WITH DESCRIPTION FOR SCHOOLS 6 AND 11 USING TEACHER SCORES FOR SEVEN CLASSROOM ENVIRONMENT SCALES

School		Student Affiliation	Interactions	Cooperation	Task Orient.	Order & Organis.	Individual-isation	Teacher Control
School 6	Cluster centre	-1.06	-1.14	-.99	-.65	-1.19	-1.13	-.04
	Description	Low	Low	Low	Low	Low	Low	Mod.
School 11	Cluster centre	1.30	.48	.32	1.32	.37	.62	.97
	Description	High	Mod.-High	Mod.-High	High	Mod.-High	High	High

BEST COPY AVAILABLE

Stage 2

This section reports on the results of interviewing conducted with administrators, teachers, students and parents in the two schools identified in the previous section. These schools, Schools 6 and 11 have been labelled School A and School B, respectively, for this part of the study. To preserve the anonymity of the two schools used in this part of the study, references to identifiable characteristics of each school have been adjusted. In the present study, all of the interviewing and transcribing of data were conducted by the researcher. This approach was important because the researcher needed to be responsive and sensitive to the context of the interview.

In each school used in this part of the study, two administrators, three teachers and two parents were interviewed individually. Twelve year 12 students were interviewed in groups of three. The interviews were semi-structured with Research Questions 3 and 4 used to focus the discussion. These research questions emanated from the findings of Stage 1 of the study. Adequate freedom was provided so that the interviewees has the opportunity to make use of the flexibility of the interview strategy in contrast to the restrictions of a questionnaire format. Interviews were of approximately 25 minutes duration.

This section is organised around Research Questions 3 and 4. For each question, preliminary assertions that sought to summarise the qualitative data were formulated. In turn, these preliminary assertions were reviewed and modified with the net result being three final assertions. By their very nature, assertions are tentative and require a form of what Dewey (1939) called *speculative audacity*. The assertions stated in these sections are final assertions — the results of a process of review and modification. Each subsection reports assertions for each area of investigation together with supporting evidence, often in the form of illustrative quotations from the interview data.

Research Question 3: What explanations can be given for the differences in the classroom environment of Catholic schools?

Assertion 1: Queensland Catholic schools that have superior classroom environments possess specific philosophical values to which the school community has a high level of commitment.

Interview data suggested a large disparity between Schools A and B with regard to the degree of commitment given to the philosophical values of the school by students and parents. Evidence showed that School B possessed philosophical values that were accepted by the entire school community — administrators, teachers, students and parents. School practice was consonant with this commitment. Although School A had a philosophical statement, the interview data showed that students and to a lesser degree parents were not committed to its values. Despite the best efforts of teachers, students did not seem to appreciate the importance of the values contained in the philosophical statement.

The fundamental nature of School B is due to a commitment to the values and ideas of St William, a religious who lived in the 14th century. The school is owned by the Catholic

religious order committed totally to creating an environment in the image of St William. The philosophy of St William dominated the culture of School B.

For instance, one School B student stated:

> St William's spirit is a very big part of the school. I remember that, when I started in grade 8, we spent a whole year of religion on St William and we did plays on his values and that sort of thing. Since then, we always have something to do with William in our school prayers.
>
> (School B, Student 3)

Even more pronounced were the views of the administration and teachers. The high profile and priority given to the William's way was evident clearly in their responses. The values of respect for each individual person, joy and simplicity were emphasised in school prayer assemblies and staff prayers. According to the administration, these values have permeated the school atmosphere to the point where the William's way has become part of the terminology and language of the school. Student and teacher behaviour has been assessed frequently in terms of their consistency with the William's values. *Remember the William's values* and *That's not very William like* have been used by teachers as reminders of a code of behaviour towards which the students have to work at all times.

Teachers readily identified the William's ethos as a very deep cultural and philosophical influence in the school to the point where it was considered to be more important than the Catholic identity as indicated in this statement from one administrator:

> I would see the Williams ethos as a particular stream or strand of Catholic identity. It is one that is more focused than just saying we are a Catholic school and have these or those values. In fact, the term Williams is probably used more frequently than Catholic.
>
> (School B, Administrator 2)

Of importance was the fact that commitments to William's values did dictate reality. Teachers were adamant that the values were not just empty rhetoric and that everyone — students, staff and parents — worked to put the values into practice at every opportunity. Interestingly, these William's values largely were unwritten. Accordingly, students were required to internalise their meanings. This is different simply to reading rhetorical statements in the front or back of a homework diary, as so often is the case with philosophical or mission statements. The comments of one teacher were very revealing:

> I think that what has been achieved here is possible in many schools but hasn't been achieved because they haven't had that one thing — here the (Williams) ideal — that ties it together. It unifies things and gives everyone some idea of what they are aiming at. It provides an explicitness. Other schools sort of know what they are supposed to be doing but there is nothing that they can relate it back to. They can't provide a feel.
>
> (School B, Teacher 2)

A much different picture of student commitment emerged from the School A data. One administrator noted that, in terms of policies,

. . . we have a very clear philosophy statement that is found around the place. It's in the student diary so everyone has a copy of it.

(School A, Administrator 1)

In contrast to the commitment of the administration and staff of School A, students could not explicate the philosophical underpinnings of their school. Student interview data for School A were devoid of any reference to the school philosophical statement or its contents. Rather, students talked constantly about friendships between each other but little about what unified the students, teachers and parents in their school. This lack of student perception of a school character manifested itself in a poor student self-image:

I don't think they have a very good self image and that does come up in the things like interschool competition. The kids often think that they are second rate. We look at the litter around the ground and think that things are not so great either.

(School A, Teacher 2)

A clear example of the lack of commitment to the values of the school was the lack of religious practice at organised school liturgies. According to the School A students, religious practice was optional and poorly attended, thus indicating that students simply were unwilling to express a religious commitment or be seen to be part of a school community that has a clear religious identity. For instance, students reported that religious services were tried in 1992 but they failed because of student non-attendance:

We tried religious services last year but they didn't work. We don't have church celebrations like masses and that. No Ash Wednesday or anything like that. If we did have them only a few would turn up. No one is used to it. It doesn't occur in this school. They do it in primary school but when they get here it stops.

(School A, Student 1)

With regard to student commitment, one teacher reported:

Some students could try a lot harder at implementing the philosophical statement in their diaries. There is not enough commitment by some students who seem to influence others.

(School A, Student 4)

In School A, students could not identify the ways in which a specific Catholic ethos existed in their school. An emphasis on the needs of the individual over the needs of the community was clearly evident in the interview data. Students simply did not do things if they could not see something in it for them. The difference between Schools A and B in terms of a commitment to their respective philosophical values was acute and suggested that School B students had a much deeper appreciation of the real purpose of their Catholic school. In essence, School A students held only a surface understanding of the purpose of their Catholic school. They were unclear about what distinguished their school from other Catholic schools and, indeed, other local high schools. Ironically, School A's philosophy statement was written in plain language but its values seemed remote to students. Its meaning was something for adults to consider and not for students to internalise and act upon.

Given that Schools A and B were chosen purposefully as extreme cases, the above discussion suggests that schools which possess philosophical values to which the school

community is committed seem to be associated with positive school and classroom environments. In particular, the qualitative data suggest that a lack of student commitment to a school's philosophical values can contribute to negative classroom environments. Clearly, students are not passive recipients in the generation of specific school and classroom environments. Their level of commitment impacts on environments, especially classroom environments. It appears that schools that articulate a set of values and establish wide community commitment to these values have more positive environments.

Assertion 1 focuses on cultural antecedents to Catholic school learning environments. It proposes that school community commitment to a set of philosophical values is associated with the quality of the learning environment. Previous research in schools has suggested that commitment to values and beliefs is critical to school effectiveness. A range of studies both in Australia and overseas have suggested that a consistent philosophy (i.e. a sense of mission) is one criterion for judging effective schools (see e.g. Caldwell & Misko, 1984; Ramsay, Sneddon, Grenfell, & Ford, 1982). Ramsay et al.'s study of successful and unsuccessful schools in New Zealand strongly supported the need for 'a clearly articulated philosophy or statement of goals' (p. 276). Importantly, they found that the content of such statements permeated the whole school because of consistent oral reinforcement. Rutter et al. (1979) concluded their intensive study of schools in inner London in a similar fashion by asserting:

> The 'atmosphere' of any particular school will be greatly influenced by the degree to which it functions as a coherent whole, with agreed ways of doing things which are consistent throughout the school and which have the general support of all staff. . . . The importance of some kind of set of values and norms of behaviour was also reflected in our findings. . . .
>
> (Rutter et al., 1979, p. 192)

In theory, every Catholic school community is well placed to have a high degree of consensus on the *Gospel* values that underpin their school because of the links that the school and families have with the Catholic church. One approach that should foster a commitment to such a set of philosophical values in the Catholic high school is the development of an identifiable charism.

Charisms work by creating an atmosphere that is pervaded by a particular spiritual characteristic and could be considered a fine-tuning of the Gospel values based on the needs of a particular school. A charism should be at the forefront of action in a school, providing a clear focusing of the "hearts and minds" of all members of the community. The contrast between the use of mission statements and the development of spiritual commitment with a charism can be understood in terms of *espoused theory* and *theory in use*. Espoused theory is associated with mission statements and purports to describe how an institution is organised and functions. Theory in use refers to the informal rules that tell people how to behave (Miller, 1994) and has a spiritual dimension.

Clearly, Catholic schools need to maintain a special identity. To achieve this goal, they must have a charism — a special spiritual characteristic to which everyone is committed. Without a charism based on values congruent with the Gospels, it is difficult to contemplate how a Catholic school could have a distinguishable environment.

The above discussion has shown the importance of Assertion 1 to contemporary Catholic education. Clearly, the issue of philosophical values to which the entire school community is committed is an issue of great import to Queensland Catholic education. The argument is that, in some way, such a commitment influences Catholic school learning environments.

Assertion 2: Formal pastoral care programs do not guarantee high-quality school and classroom environments in Catholic high schools.

An emergent issue of the interview process was the disparity between the emphasis on formal pastoral care in School A and School B. It was decided to investigate this issue more closely because it was thought that pastoral care should have some effect on the psychosocial environment of schools and their classrooms. In addition, Catholic school literature emphasises pastoral care as being fundamental to the Catholic school. In fact, attempts to implement formal pastoral programs have become commonplace in Queensland Catholic schools during the past decade.

Both of the schools used in this part of the study had pastoral care structures which involved students meeting in groups with a tutor (a staff member) for a period of about 15 minutes every day. In addition, School A students were involved in formal pastoral care activities in their pastoral groups every Thursday afternoon for 1½ hours. Thus, about 12% of School A and 5% of School B classroom contact time was assigned to formal pastoral care. Times for pastoral care were sanctioned officially and were part of the regular school timetable. In both schools, the pastoral care groupings (i.e. students and tutor) were arranged by the school administration. According to the students and teachers in both schools, these groups provided teachers with the opportunity to relate with students in a different way than in the normal classrooms because pastoral groups emphasise affective rather than cognitive outcomes.

Although both schools had pastoral care structures, it became clear that School A staff thought that their pastoral care program was central to their school's philosophy:

> The pastoral structures and program are fundamental. The students are in their groups but the thrust from administration is that teachers do work with students in that group. There is an acceptance by teachers that they have got a range of students in their group and they have to protect and foster the students. Some (students) come from homes where faith is important and is practised. But there are students whose backgrounds are questionable.
>
> (School A, Administrator 1)

Pastoral care groups have been part of the uniqueness of School A for a long time:

> Fifteen years ago, they were seen as radical. It's obviously not radical these days. I guess that we were one of the first schools to articulate a lot of things like pastoral care and to back that up with timetabling commitment. That sort of approach has flowed through the school. It makes my job easier because it is part of the ethos of the school and is not perceived as tacked on.
>
> (School A, Administrator 1)

Another component of the pastoral care program of both schools was a *peer support* structure in which senior students visited lower grades to talk about school activities and relate generally with the students. In School A, about half of the year 12 students were involved in this process. In School B, Year 12 *class consultants* visited lower grades to talk about forthcoming school events. In addition, School B had implemented a *big sister - little sister* arrangement in which each year 8 student had a year 12 student whom they could seek out if needed. In both schools, students spoke highly of the benefits of peer support as a means of developing dialogue between older and younger students.

One senior teacher in School A noted that peer support was a vital part of the school:

> It provides students in year 12 with the time to offer others something. For the past two years, it has been timetabled as part of the formal school week and this has improved its status. So its not just something that happens at lunchtime or when you get pulled out of class.
>
> (School A, Teacher 2)

Even though School B had pastoral care structures, it can be described as having a much more traditional approach to pastoral care than School A. Teachers in School B felt that the ethos of the school due to William's values required teachers to care for students at all times, not just in formal lessons set aside for pastoral care. Students confirmed that the overall atmosphere of the school was much more important to the caring in the school than formal lessons:

> The caring in this school happens all the time. Teachers talk to you outside classrooms and when you are waiting for buses and that sort of thing. It doesn't just happen in classrooms or in the times we spend with our p.c. (pastoral care) teachers. The friendly atmosphere allows things to happen.
>
> (School B, Student 4)

School A staff believed that their pastoral care programs were so important that they essentially defined the school's mission. One teacher stated that the formal pastoral care program in the school contributed fundamentally to the atmosphere of the school. Students in both schools felt that the time spent in formal pastoral care was useful. They were less able to show its impact on student cooperation and the environment of classes. However, especially in School A, the teachers felt that formal pastoral care influenced relationships with other students. There was little doubt that formal pastoral care had a much higher profile in School A compared to School B.

The data collected in these two schools show that an extensive and structured pastoral care program does not guarantee positive school and classroom environments. On the one hand, people interviewed in School A considered pastoral care structures to be the most distinguishing aspect of their school and yet its classroom environment profiles were negative compared to School B. This result is underscored by the fact that pastoral care structures had existed in School A for an extensive period of time (about 15 years). That is, School A's formal pastoral care program was a cultural rather than short-term administrative characteristic and any positive influence that it might have on the

psychosocial environment of the classrooms should have been evidenced in the classroom environment assessments of students and teachers.

On the other hand, School B's quantitative data indicated that it had very positive school and classroom environments. Although formal pastoral care structures existed in School B, they did not assume the cultural prominence of School A's structures. School B's program was certainly not as formal as School A. Based on these data, formal pastoral care programs do not guarantee positive environments. It needs to be understood that Assertion 2 does not imply that formal pastoral care is unimportant to the quality of the learning environment. Rather, the evidence from these two schools merely suggests that the existence of formal pastoral care programs is not a sufficient condition for exemplary environments. The possibility that classroom environment has more potent predictors than formal pastoral care programs of schools needs to be recognised. Nevertheless, Assertion 2 reflects accurately the interview data from these two schools.

The fact that the issue of pastoral care emerged from the interview process underscores the importance of the qualitative component of this study. Assertion 2 was based on unexpected evidence that challenges the generally accepted view about the benefits of formal pastoral care structures.

Despite a plethora of articles and books describing the importance of pastoral care in Catholic schools, little research into its effectiveness has occurred (Dwyer 1986; Treston, 1992). The adoption of formal pastoral care programs by administrators of Queensland Catholic schools has reached bandwagon status. There are three orientations to pastoral care in Catholic schools. First, there is the holistic view in which pastoral care is viewed as a total expression of the school's service to the child. This orientation does not see pastoral care in Catholic schools as a formal program but rather as a phenomenon that permeates the school's modus operandi. Second, some authors focus on the pastoral organisation of schools (e.g. Best, Ribbins, Jarvis, & Oddy, 1983). For example, schools usually have vertical organisation (via a house system) or horizontal organisation (via a year system). A third approach to pastoral care in schools is to opt for a formal program in which teachers take formal classes on a range of issues but generally within the personal development area. Such a program is considered part of the formal curriculum and is timetabled like any other subject. with substantial amounts of time allocated.

Assertion 2 was based on very clear evidence from the two extreme cases. On the one hand, School A had a very extensive, formal pastoral care program which had been in place for nearly 15 years. That is, the program was part of the culture of the school and the administration and teachers felt that it was the most distinguishing, fundamental characteristic of the school. On the other hand, although School B had pastoral care time, it was not nearly as extensive as School A. School B staff placed greater emphasis on their well-articulated charism rather than formal structures. Thus, there were three pastoral care differences between School A and School B, namely, time allocation, formality of program and, most importantly, the psychosocial priority given to pastoral care in the school.

The mismatch between the emphasis on the formal pastoral care structures and classroom learning environment was very high for both schools. School A had high pastoral care

structure and low classroom environment scores whereas School B had low to medium levels of pastoral care structure and very positive classroom environment. It needs to be acknowledged that, if there had been no formal pastoral care program in School A, the classroom environment in School A might have been even worse than that reported by students. However, the very low scale scores suggest that any upward shift in scores due to the pastoral care program could only have been minimal. This result means that the formal pastoral care program in School A probably was ineffective in enhancing the classroom environment.

From Assertion 2, it can be argued that formal pastoral care programs are not the panacea that folklore suggests. Philosophically, the very idea of creating a pastoral care program in which a teacher meets with 15 or so students "to be pastoral cared" is inconsistent with the way true relationships are formed. True pastoral care never can be imposed. Contrived relationships are unsustainable and attempts to force feed pastoral care to students without due regard for the way true relationships are formed might not be very productive. Moreover, emphasising the importance of high-quality relationships in all school settings at all times, both as goals in their own right and for the promotion of cognitive and affective learning, might be a more fruitful direction for Catholic schools.

Assertion 2 is supported by Treston (1992) who believes that 'pastoral care is not an extra thing added to a crowded curriculum but the energy of concern which integrates the social, academic, religious, and skills dimensions of learning' (p. 32). To expend this energy of concern, it is not mandatory to have a formal pastoral care program. This view is consistent with Flynn's (1985) conceptualisation of the curriculum of Catholic schools which views pastoral care as part of the informal rather formal curriculum. Little guarantee for the quality of the learning environment is provided by formal pastoral care programs. Given the considerable amount of time allocated to formal pastoral care programs in many Catholic schools, the nature of the relationship between pastoral care and environment demands further empirical study.

Research Question 4: Why are the environments of religion and science classes so similar?

Assertion 3: In religion classes, teachers utilise strategies and competencies that they have found to be successful in their other teaching areas.

Quantitative data reported earlier in this paper showed that the classroom environment of science and religion classes were remarkably similar. Apart from Cooperation and Task Orientation, students held very similar perceptions of science and religion classes. Plausible reasons for this result were investigated through interview data obtained from administrators, teachers and students. Assertion 3 summarises the results of these investigations.

Teacher interview data revealed that most religion teachers had not received preservice education in the teaching of religion. Of the teachers interviewed, none held specialist religion qualifications. Furthermore, the teachers agreed that the vast majority of teachers in Catholic schools neither have studied religion and theology nor have trained to teach

religion in high schools. The only real qualification was being Catholic. It was clear that religion teachers were essentially teachers of other subject areas who volunteered to teach religion. One teacher noted:

> Well, I don't classify myself as a religion teacher. I am a maths-science teacher who helps out by taking a religion class. I'll never see myself as a specialist religion teacher but I'm willing to do my bit for the school.
>
> (School B, Teacher 1)

The importance of recruiting staff who have preservice qualifications in the teaching of religion was considered important.

> We would like to have specialist religion teachers on at least years 11 and 12 but it is a long way off at the moment. The religion teachers try hard at a difficult subject to teach. They are nearly all teachers of other subjects.
>
> (School A, Administrator 2)

When asked to describe their special approach to teaching religion, teachers conceded that they had no special method. Moreover, they used strategies that worked successfully in their other teaching areas at that year level:

> When I first started teaching year 9 religion, I used my experience and knowledge of teaching year 9 social education as a starting point. While the content is different, my approach in the classroom is much the same. The students respond to the same sorts of things whether it is religion or social education or any other subject. The personality of the teacher has a lot to do with it — more than the subject.
>
> (School B, Teacher 1)

Although teachers adjusted their teaching approach for different year levels (i.e. year 12 were taught differently from year 9), similar adjustments were not made for religion compared to other subjects within a particular year level. Religion was taught in much the same way as other subjects in that year level.

Informative student data came from two School A students who had the same teacher for religion and one other subject. The first student had the same teacher for religion and chemistry and felt that the teacher's approach was very similar in both classes except for assessment. This opinion provides some explanation for the perceived higher Task Orientation of science classes compared to religion classes found in the quantitative component of the study:

> It has a lot to do with the teacher. There isn't a lot of difference in the atmosphere of religion and chemistry. We get on well with the teacher and with each other. We have a lot more assessment in chemistry. You don't have to work very hard in religion.
>
> (School A, Student 1)

The second student, who had the same teacher for religion and geography, reported little difference in teaching methods between the classes:

> The religion class is smaller. The teacher is tougher on the students in geography, probably because of the bigger class. But the relationships are much the same and the way we work is much the same.
>
> (School A, Student 10)

This teacher had no formal preparation for the teaching of religion and it is reasonable to believe that the strategies used in religion classes were those found to be successful in geography classes. This view was confirmed by the teacher:

> I think that my style of teaching does not vary between religion and other classes very much. You have to develop relationships in the same way. I have a few fairly standard ways of operating in classrooms, irrespective of subject.
>
> (School A, Teacher 2)

The student and teacher data support the view that environments in religion and other classes in the same year level are similar because religion teachers use strategies which have proved to be successful in their other teaching areas. In essence, the teaching of religion has been "colonised" by teachers of other subjects who apply successful strategies and competencies of their other subject areas in religion classes. This argument provides some explanation for the close similarity in the profiles of religion and science classes shown in Table 4.

Historically, priests, brothers and nuns took religion classes in Catholic high schools. The vacuum created by the fall in the numbers of religious in Queensland Catholic schools has been filled by the laity, the vast majority of whom did not receive any formal preservice education in the teaching of religion. A number of teachers have received inservice support but a lack of confidence has been the general characteristic of religion teachers. It is clear that there are very few teachers who would identify themselves as specialist religion teachers. Because high teaching in Queensland has demanded that teachers have at least two teaching areas, religion often is considered a third subject.

Conclusion

This article has presented the findings of research conducted in Australian Catholic high schools. The findings are of importance to Catholic education administrators, teachers and researchers and researchers. Overall, the study demonstrates the importance of classroom environments to Catholic schools. An important aspect of this study was the use of quantitative and qualitative data collection methods in a complementary manner. This approach represents a departure from the traditional quantitative methodology of learning environment research. Additionally, the manner in which quantitative and qualitative methods were employed in the study was novel in that quantitative data were used to identify data collection sites and research questions for the exploratory qualitative component.

References

Best, R., Ribbins, P., Jarvis, C., & Oddy, D. (1983). *Education and care: The study of a school and its pastoral organization*. London: Heinemann.

Bryman, A. (1988). *Quantity and quality in social science research*. London: Unwin Hyman.

Burden, R.L., & Fraser, B.J. (1993). Use of classroom assessments in school psychology: A British perspective. *Psychology in the Schools*, 30, 232-240.

Caldwell, B., & Misko, J. (1984). School-based budgeting: A financial strategy meeting the needs of students. *Educational Administration Review, 2*(1), 29-59.

Chavez, R.C. (1984). The use of high inference measures to study classroom environments: A review. *Review of Educational Research*, 54, 237-261.

Dewey, J. (1939). Philosophy and culture. In J. Ratner (Ed.), *Intelligence in the modern world* (245-255). New York: Modern Library.

Dorman, J.P. (1994). *A Study of School and Classroom Environments in Queensland Catholic Secondary Schools*. Unpublished PhD thesis, Curtin University of Technology, Perth.

Dorman, J.P., Fraser, B.J., & McRobbie, C.J. (1995). Associations between school-level environments and science classroom environments in Australian secondary schools. *Research in Science Education, 25,* 333-351.

Dwyer, B. (1986). *Catholic schools at the crossroads*. Blackburn, Victoria: Dove.

Erickson, F. (1986). Qualitative methods in research on teaching. In M. C. Wittrock (Ed.), *Handbook of research on teaching* (3rd ed., pp. 119-160). New York: Macmillan.

Firestone, W.A. (1993). Alternative arguments for generalising from data as applied to qualitative research. *Educational Researcher, 22*(4), 16-22.

Fisher, D.L., Fraser, B.J., & Kent, H.A. (1995). *Relationship Between Teacher Personality and Interpersonal Teacher Behavior*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco.

Flynn, M. (1985). *The effectiveness of Catholic schools*. Homebush, New South Wales: St Paul Publications.

Fraser, B.J. (1986). *Classroom environment*. London: Croom Helm.

Fraser, B.J. (1990). *Individualised Classroom Environment Questionnaire*. Melbourne: Australian Council for Educational Research).

Fraser, B.J. (1994). Context: classroom and school climate. In D. Gabel (Ed.) *Handbook of Research on Science Teaching and Learning* (pp. 493-541). New York: Macmillan.

Fraser, B.J., Anderson, G.J., & Walberg H.J. (1982). *Assessment of learning environments: Manual for learning environment inventory (LEI) and My Class Inventory (MCI) (3rd version)*. Perth: Western Australian Institute of Technology.

Fraser, B.J., & Tobin, K. (1991). Combining qualitative and quantitative methods in classroom environment research. In B.J. Fraser & H.J. Walberg (Eds.), *Educational environments: Evaluation, antecedents and consequences* (pp. 271-292). London: Pergamon.

Genn, J.M. (1984). Research into the climates of Australian schools, colleges and universities: Contributions and potential of need-press theory. *Australian Journal of Education*, 28, 227-248.

Groome, T.H. (1980). *Christian Religious Education: Sharing our Story and Vision* (Melbourne, Dove).

Howe, K.R. (1985). Two dogmas of educational research. *Educational researcher*, *14*(8), 10-18.

Jick, T.D. (1985). Mixing qualitative and quantitative methods: Triangulation in action. In J. van Mannen (Ed.), *Qualitative methodology* (pp. 135-148). Beverly Hills, CA: Sage.

Levy, J., Wubbels, Th.,& Brekelmans, M. (1996). *Cultural Factors in Students' Perceptions of the Learning Environment*. Paper presented at the annual meeting of the American Educational Research Association, New York.

Lorsbach, A. & Tobin, K. (1992). Constructivism as a referent for science teaching, *National Association for Research in Science Teaching (NARST) News, 34*(3), 9-11.

Madey, D.L. (1982). Some benefits of integrating qualitative and quantitative methods in program evaluation, with illustrations. *Educational Evaluation and Policy Analysis, 4*, 223-236.

Maor, D., & Fraser, B.J. (in press). Use of classroom environment perceptions in evaluating inquiry-based computer assisted learning. *International Journal of Science Education*.

McMillan, J.H., & Schumacher, S. (1993). *Research in education: A conceptual introduction* (5th ed.). New York: Harper Collins.

McRobbie, C.J., & Fraser, B.J. (1993). Associations between student outcomes and psychosocial science environments. *Journal of Educational Research*, 87(2), 78-85.

Miller, A. (1994). Staff culture, boundary maintenance and successful behavioural interventions in primary schools. *Research Papers in Education: Policy and Practice, 9*(1), 31-51.

Moos, R.H., & Trickett, E.J. (1987). *Classroom Environment Scale Manual* (2nd ed.) (Palo Alto, CA, Consulting Psychologists Press).

Patton, M.Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: Sage.

Ramsay, P., Sneddon, D., Grenfell, J., & Ford, I. (1983). Successful and unsuccessful schools: A study in southern Auckland. *Australian and New Zealand Journal of Sociology, 19*, 272-304.

Rennie, L.J., & Parker, L. (1996). *Monitoring Gendered Learning Environments in Single-Sex and Mixed-Sex Classes*. Paper presented at the annual meeting of the American Educational Research Association, New York.

Rutter, M., Maughan, B., Mortimore, P., Ouston, J., & Smith, A. (1979). *Fifteen thousand hours: Secondary schools and their effects on children*. Somerset, England: Open Books.

Smith, D., & Fraser, B.J. (1980). Towards a confluence of quantitative and qualitative approaches in curriculum evaluation. *Journal of Curriculum Studies, 12*, 367-370.

Smith, J., & Heshusius, L. (1986). Closing down the conversation: The end of the quantitative-qualitative debate among educational inquirers. *Educational Researcher, 15*(1), 4-12.

Templeton, R.A., & Jensen, R.A. (1993). How exemplary teachers perceive their school environments. In D.L. Fisher (Ed.), *The study of learning environments* (Vol. 7, pp. 94-105). Perth: Science and Mathematics Education Centre, Curtin University of Technology.

Tobin, K., & Fraser, B. J. (in press). Learning from investigations of exemplary teachers. In H. C. Waxman & H. J. Walberg (Eds.), *Contemporary research on teaching*. Yearbook of the National Society for the Study of Education (NSSE). Berkeley, CA: McCutchan.

Treston, K. (1992). *Transforming Catholic schools: Visions and practices for renewal.* Brisbane: Creation Enterprises.

Trickett, E.J., Trickett, P.K., Castro, J.J. and Schaffner, P. (1982). The independent school experience: Aspects of normative environments of single sex and coed secondary schools. *Journal of Educational Psychology*, 74, 374-381.

Waldrip, B., & Fisher, D.L. (1996). *Associations Between Students' Cultural Factors, Students' Attitudes, and Teacher-Student Interactions*. Paper presented at the annual meeting of the American Educational Research Association, New York.